

## ***EXPERIENCE STUDY – STATE TEACHERS’ RETIREMENT SYSTEM***

### **Introduction**

The Public Employee Retirement Administration Commission (PERAC) has completed an Experience Study of the State Teachers’ Retirement System and Boston teachers. This study reflects the second part of our analysis of the actuarial assumptions used in determining Commonwealth liabilities.

This report presents the results of the experience study for members of the State Teachers’ Retirement System and Boston teachers over the five-year period from January 1, 1995 through December 31, 1999. The results of the experience study for the Boston teachers yielded comparable results to that of the State teachers. Therefore, we have not shown the results separately. Our analysis and discussion focuses on the results of the State Teachers’ study. Two elements were essential in performing this study: software capable of performing a thorough analysis for such a large group and accurate data.

One of PERAC’s first initiatives was the procurement of new software for performing actuarial valuations and experience studies. After an RFP process, the new software was purchased in 1998, customized for Chapter 32, and implemented and tested throughout 1999. Apart from improving the quality and efficiency of valuations, the new software has the capability of performing a detailed historical experience analysis that the prior system could not produce due to software constraints.

The nature of an experience study is to track how members leave a system (retirement, death, disability, or withdrawal). This task requires not only accurate data but also more detailed data than a regular actuarial valuation requires. We received data counts from the State Teachers’ Retirement Board of the number of members leaving service each year for each decrement outlined above to aid us in our data reconciliations and confirm our results.

In the past few actuarial valuations, PERAC has needed to estimate salary for a significant number of members due to questionable reported pay. In addition, since actual credited service is not provided to us, each year we estimate service based on a member’s original date of hire as recorded by the State Teachers’ System. For these reasons, the salary analysis and any experience results based on service may not be as reliable as the other components of this study.

This report, in conjunction with the State Experience Study, represents the first detailed experience study completed by PERAC. However, each year as part of the actuarial valuation, we test how well the assumptions are working by performing a gain/loss analysis. If plan liabilities increase more than assumed, there is an actuarial loss. If plan liabilities increase less than assumed, there is an actuarial gain. If each year the results consistently produced an actuarial loss (or an actuarial gain), then this would indicate that the assumptions are not properly reflecting actual experience. In this way, the gain/loss analysis serves as a proxy to the performance of a detailed experience study.

## ***EXPERIENCE STUDY – STATE TEACHERS’ RETIREMENT SYSTEM***

### **Introduction (continued)**

We reviewed the gains and losses on plan liabilities (excluding asset gains and losses) from 1990 (the first PERA actuarial valuation for the Commonwealth) through 1999. PERA/PERAC performed Commonwealth valuations in 1990, 1992, 1993, 1995, 1996, 1998, 1999, and 2000. Our review of the past gains and losses shows the results to be within a reasonable range. For the State Teachers’ Retirement System, there is a cumulative gain (experience better than anticipated) of approximately \$500 million over the 10 year period. This amount is quite small considering the total accrued liability of approximately \$16.4 billion as of January 1, 2000.

As part of this experience study, we performed a detailed member reconciliation of actual retirements, terminations, and disabilities over the 5-year period. We analyzed these results using not only our valuation data from each year, but also listings generated by the PERAC disability unit, and additional information provided by the State Teachers’ Retirement Board regarding the number of retirements, terminations, deaths and disabilities for each year of the study period.

The annual funding schedule appropriation (the total plan cost) reflects two sources. The first is the amortization of the unfunded liability. The actuarial accrued liability less plan assets equals the unfunded liability. The unfunded liability is amortized through FY2017 under the current schedule. In addition to the amortization of the unfunded liability, the annual appropriation also reflects the normal cost (or current cost), which represents the value of benefits accruing during the coming year. The measure of the impact on the total plan cost of any change in assumptions is the impact of that change on these two components.

Although the normal cost and accrued liability directly determine the appropriation under the funding schedule, these items are components that make up a portion of the present value of future benefits (PVFB). The PVFB may be the most accurate measure of the “true” total cost of a plan since it represents the present value of total projected benefits for all active, inactive and retired members. Any change in the actuarial assumptions will change the PVFB and, accordingly, the normal cost and accrued liability (and thereby the amortization of the unfunded liability).

Our proposed assumptions generally increase turnover rates, decrease disability rates and decrease the salary increase assumption. These changes decrease total plan cost. For example, higher turnover means that members are more likely to leave service before they become vested, thereby reducing retirement benefits to be paid. Also, our proposed assumptions generally increase retirement rates and decrease mortality rates. These changes serve to increase total plan cost.

Based on the January 1, 2000 actuarial valuation results, the proposed assumptions would produce a total cost (normal cost and amortization of the unfunded liability) that is slightly greater than that produced under the current assumptions. The proposed assumptions will first be implemented in the January 1, 2001 actuarial valuation. That valuation will also reflect investment return experience during 2000, any gains or losses on plan liabilities, and the impact of recent legislation. It should be noted that the passage of Chapter 114 of the Acts of 2000 should have a significant effect on retirement and termination rates. The

## ***EXPERIENCE STUDY – STATE TEACHERS’ RETIREMENT SYSTEM***

### **Introduction (continued)**

proposed rates in this report reflect only the past experience of the State and Boston teachers. We will monitor the experience including Chapter 114 each year and recommend changes to any of the assumptions as necessary.

It is important to note that the results for the State and Boston teachers reflect only one component of the total Commonwealth obligation. The next funding schedule adopted will also include results for State Employees as well as the local COLA liability. The State experience study was released earlier this year and indicated a decrease in total cost would result from the proposed change in assumptions. This decrease, combined with the slight increase reported in this study, results in an overall decrease in total cost to the Commonwealth. In light of the common goal of addressing the pension funding of the Commonwealth in a disciplined and appropriate manner, it is recommended that no change in the existing funding schedule take place at this time that would reduce the current level of appropriation.

We gratefully acknowledge the efforts of the State Teachers’ Retirement Board staff in completing this project. We would also like to thank the members of PERAC’s *Actuarial Advisory Committee*: David Driscoll, Buck Consultants, Inc.; Wilson Lowry, Watson Wyatt Worldwide; Joseph Macaulay, George Beram & Co., Inc.; Kathy Riley, The Segal Company; Dan Sherman, PricewaterhouseCoopers, LLP; Larry Stone, Stone Consulting; and David Wean, John Hancock Actuarial Consulting Services. We presented our methodology, findings, and proposed assumptions to the Committee at several meetings this year. The Committee provided comments and suggestions with respect to our preparation of this report.

Respectfully submitted,  
Public Employee Retirement Administration  
Commission

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